

(19)日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11)特許出願公開番号

特開2003-1282

(P2003-1282A)

(43)公開日 平成15年1月7日(2003.1.7)

(51)Int.Cl.<sup>7</sup>

識別記号

F I

テマコード\*(参考)

C 0 2 F 3/02

Z A B

C 0 2 F 3/02

Z A B Z 2 D 0 6 3

B 0 1 D 29/27

1/40

A 4 D 0 0 3

C 0 2 F 1/40

3/00

D 4 D 0 2 7

3/00

E 0 3 F 5/16

4 D 0 4 1

E 0 3 F 5/16

B 0 1 D 23/04

4 D 0 5 1

審査請求 未請求 請求項の数3 O L (全 9 頁)

(21)出願番号 特願2001-189874(P2001-189874)

(22)出願日 平成13年6月22日(2001.6.22)

(71)出願人 501252504

北山 晴一

兵庫県姫路市書写400-9

(72)発明者 木下 光次

埼玉県越谷市神明町2丁目333-12

(74)代理人 100087941

弁理士 杉本 修司 (外2名)

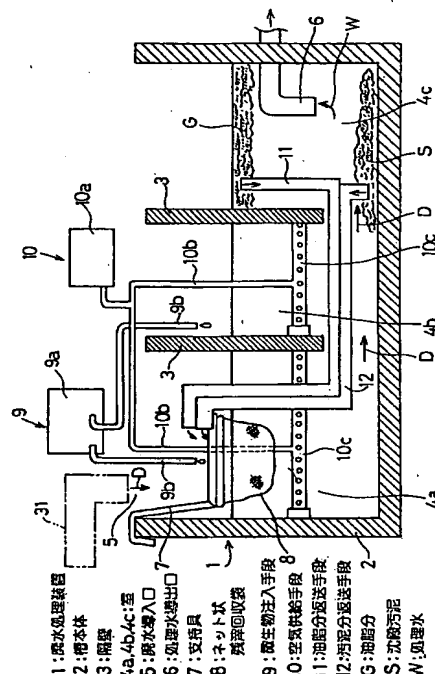
最終頁に続く

(54)【発明の名称】 廃水処理装置

(57)【要約】

【課題】 油脂分及び汚泥の除去作業を不要とし、厨房排水を浄化処理できる廃水処理装置を提供する。

【解決手段】 廃水導入口5から導入される厨房排水を受けて有機残滓を濾過する残滓回収袋8と、槽内に導入される廃水に対して好気性微生物を添加する微生物注入手段9と、前記好気性微生物の働きを活性化させるため、廃水中に空気を送り込む空気供給手段10と、前記槽内上側に溜まる油脂分を前記残滓回収袋8内に戻す油脂分返送手段11と、前記槽内底側に堆積する汚泥分を前記残滓回収袋8内に戻す汚泥分返送手段12とを備え、前記油脂分及び汚泥を強制的に残滓回収袋8に戻して微生物処理がエンドレスに行われるようにした。



## 【特許請求の範囲】

【請求項1】 隔壁で槽内を複数の室に仕切り、かつ隣接する各室をその下部にて相互連通するように構成した槽本体と、前記槽本体内に外部からの廃水を導入する廃水導入口と、前記廃水処理後の処理水を槽本体外部に導出する処理水導出口とを備え、槽内に導入した廃水を油水分離して槽内上側に油脂分を油脂層として浮遊させ、前記油脂分が除かれ、かつ固形物を槽底に沈殿汚泥層として分離させた上澄み液を処理水として槽外へ排出する廃水処理装置であって、前記廃水導入口から槽内に導入される廃水を受けて濾過する残滓回収袋と、槽内に導入された廃水に対して好気性微生物を添加する微生物注入手段と、廃水中に空気を送り込んで前記好気性微生物の働きを活性化させる空気供給手段と、槽内上側に浮遊して溜まる油脂分をポンプ作用によって前記残滓回収袋内に戻す油脂分返送手段と、槽内底側に沈殿する汚泥分をポンプ作用によって前記残滓回収袋内に戻す汚泥分返送手段とを備えている廃水処理装置。

【請求項2】 請求項1において、前記残滓回収袋を取付支持する支持具が前記槽本体に対して着脱自在に係止されている廃水処理装置。

【請求項3】 請求項2において、前記残滓回収袋が前記支持具の取付部位に対して着脱自在に設定されている廃水処理装置。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、廃水を浄化する廃水処理装置に関し、特に、ファミリーレストランや飲食店等の厨房内等から排出される油脂分を含んだ厨房排水の処理に用いられる廃水処理装置に関する。

## 【0002】

【従来の技術】飲食店やファミリーレストラン等からの厨房排水（廃水）の中には、調理に使った動植物油が多く含まれているが、これらの油脂分を何ら処理することなくそのまま、流してしまうと、排水管を流れていく間に冷却、凝固して排水管内壁に付着し、浄化槽の働きを悪くしたり、また河川等を汚染する原因となる。したがって、飲食店やファミリーレストランに限らず、例えばホテル・旅館、病院・学校施設、お惣菜店、スーパーマーケット、食品加工工場、社員食堂・寮等の厨房設備を備えた場所には、1976年建設省告示1597号及び1674号により、廃水処理装置としてグリーストラップ槽（グリース阻集器）の設置が義務付けられている。

【0003】このグリーストラップ槽は、厨房排水等の廃水を油水分離して油脂分を除去するもので、流しから流れた廃水の流速を遅くし、さらに前記廃水が槽内を流れて移動する過程で自然冷却させ、かつ廃水中に含まれ

る油脂分と水分との比重差を利用して前記油脂分を槽内上側に油脂層として浮遊させて回収し、一方、前記油脂層の下側に分離され、かつ固形物を沈殿汚泥層として分離させた上澄み液を処理水として外部に排出する。

【0004】ここで、前記グリーストラップ槽の基本的な構成例について図7により説明する。すなわち、図7に示すグリーストラップ槽20は、槽本体21と、この槽本体21内を複数の室（図例の場合、第1、第2及び第3の室23a、23b、23cの3つの室）に仕切る隔壁22、22と、これらの隔壁22、22によって仕切られた第1の室23a内に槽底より離間させて設置した残滓かご24と、この残滓かご24内に厨房排水を導入する廃水導入管25と、第3の室23c内と外部の下水道管に接続される排水管27とを連絡する排出ドレン26とから構成されている。また、前記隔壁22、22は前記第1、第2及び第3の室23a、23b、23cの下部が相互連通可能となるように槽本体21の底部との間に連通口28a、28bが形成されるようにして取り付けられている。さらに、前記残滓かご24は、その周囲全面に所定寸法の穴を多数形成することにより水切り機能を保持させたものであって、この中に導入された廃水D中の有機残滓が内部に濾し取られるように構造になっている。

【0005】前記のように構成されるグリーストラップ槽20によれば、まず、流し等からの厨房排水が廃水導入ガイド25を通して前記第1の室23aの残滓かご24内に導入される。この残滓かご24内に導入された厨房排水は、その中に含まれる残飯等の有機残滓がその内部に取り除かれ、有機残滓が取り除かれた後には、矢印Aで示すように、下部連通口28aを通して隣の第2の室23bに入り込む。そして、第2の室23bに入り込んだ後、さらに、下部連通口28bを通して最終室である第3の室23cに入り込む。

【0006】このようにして、残滓かご24内で有機残滓が取り除かれた廃水Dは、第1の室23aから第2の室23b、そして第3の室23cに入り込んで順次移動する過程で前記廃水Dの流速が遅くなり、かつ自然冷却される。そして、前記廃水中に含まれる油脂分と水分とがその比重差によって油脂分が槽内上側に浮遊して油脂層Gとして溜まる。一方、油脂分の下側に分離され、固形物を槽底に沈殿汚泥（スラッジ）層Sとして分離させた上澄み液Wが処理水として排出ドレン26を介して排水管28内に流れ込み、最終的に外部の下水道管に排出される。なお、前記残滓かご24内に濾し取られて溜まる有機残滓については、残滓かご24を槽内から定期的に引き上げて取り除くようにしている。

## 【0007】

【発明が解決しようとする課題】ところが、前記槽内の上側に分離されて浮遊して溜まる油脂分Gや槽内底側に堆積する沈殿汚泥層Sについては、素人には取扱いにく

3

く、嫌忌されがちな作業であることから、前記油脂分や沈殿汚泥層Sの除去は後回しになりがちとなるのが実情であった。このように、油脂分(油脂層)Gの除去が適切に行われないと、特に夏季等の高温時には槽内で前記油脂分Gが腐敗しやすく、悪臭・異臭の発生の原因となつて、厨房設備等を備える施設には望ましくない。また、油脂分Gが適切に除去されず、そのまま溜まっていくと、その一部が排出ドレン26の中に入り込んで排出管27より排出されるが、前記油脂分は経時的に排出ドレン26の内壁にコレストロールのように付着堆積し、排水管27の詰まりの原因になる。

【0008】また、槽内底側に堆積する沈殿汚泥Sを長らく放置しておけば、前記油脂分Gと同様、排出ドレン26に入り込んで排出管27より排出され、排水管28の詰まりの原因となる。さらに、このような油脂分Gや沈殿汚泥Sが処理水Wとともに排出管27から排出されると、処理水Wの水質が極度に悪化し、水質基準に適合しなくなる恐れもある。したがって、槽内上側に浮遊して溜まる油脂分G及び槽内底側に堆積する沈殿汚泥Sについては、もっぱらバキューム業者によって定期的にバキュームで吸引除去しているのが現状である。さらに、前記残滓がご24の清掃も毎日行わなければ、その中に溜まった有機残滓がゴキブリ等の害虫やネズミ等の温床ともなり、また、雑菌の繁殖を来すおそれもあり、衛生環境上きわめて好ましくない状況となる。

【0009】また、前記バキューム作業も厨房設備が1～2階にある場合はともかく、高層階にあるような場合には、グリーストラップ槽までバキューム機を搬入するのに問題があり、何度も往復するといった作業となつて、きわめて効率が悪い。

【0010】また、グリーストラップ槽内の油脂分や汚泥の吸い上げ作業を行っただけでは排水管の詰まりには対応できない。このため、年に少なくとも1～2回程度は排水管の高圧洗浄を行わなければならず、コスト高な作業を強いられる。また、突然、排水管に詰まりが発生すると、営業を休業せざるをえず、甚大な損害を蒙るおそれもあった。

【0011】さらに、前記グリーストラップ槽は、もっぱら廃水の油水分離に着目した物理的処理であるから、処理後に排出される処理水中のBOD(生物学的化学酸素要求量)、SS(固形物)及びノルマルヘキサン抽出物質の量の削減についてまでは考慮されていない。したがって、前記油脂分や沈殿汚泥が処理水に混じって排出されない限りは、現行の環境基準を満たすものの、前記油脂分や沈殿汚泥が前記処理水に混じって排出された場合には、前記環境基準を満たさないおそれがあり、この場合、監督庁から指導を受けるおそれもある。加えて、近い将来益々厳しくなると想定される水質汚濁基準を考慮すれば、前記BOD、SS及びノルマルヘキサン抽出物質の量を減少させる生物化学処理(微生物処理)機能を

4

も合わせ持つようにグリーストラップ槽の構造を改良することが望まれていた。

【0012】本発明は、前記した課題に着目してなされたもので、主にグリーストラップ槽本来の機能を長期間にわたって維持し、加えて槽内に分離された油脂分及び沈殿汚泥を酸化分解することでこれらを消滅もしくは激減させ、これにより前記油脂分及び沈殿汚泥の除去作業をも不要とし、かつ環境基準を満たす処理水を排出することのできる廃水処理装置を提供することを目的とする。

10 【0013】

【課題を解決するための手段】前記した目的を達成するために、本発明にかかる廃水処理装置は、隔壁で槽内を複数の室に仕切り、かつ隣接する各室をその下部にて相互連通するように構成した槽本体と、前記槽本体内部に外部からの廃水を導入する廃水導入口と、前記廃水処理後の処理水を槽本体外部に導出する処理水導出口とを備え、槽内に導入した廃水を油水分離して槽内上側に油脂分を油脂層として浮遊させ、前記油脂分が除かれ、かつ固形物を槽底に沈殿汚泥層として分離させた上澄み液を処理水として槽外へ排出する廃水処理装置であつて、前記廃水導入口から槽内に導入される廃水を受けて濾過する残滓回収袋と、槽内に導入される廃水に対して好気性微生物を添加する微生物注入手段と、廃水中に空気を送り込んで前記好気性微生物の働きを活性化させる空気供給手段と、槽内上側に浮遊して溜まる油脂分をポンプ作用によって前記残滓回収袋内に戻す油脂分返送手段と、槽内底側に沈殿する汚泥分をポンプ作用によって前記残滓回収袋内に戻す汚泥返送手段とを備えている。

【0014】この廃水処理装置によれば、例えば厨房排水等の、油脂分が多く含まれる廃水が廃水導入口から残滓回収袋内に導入されると、その中に混じっている残飯等の有機残滓が濾し取られて前記残滓回収袋内に取り除かれ、これにより濾過された廃水が下方に流れ落ちて溜まる。この廃水が一定の水位に達すると、残滓回収袋が設けられた室と、これに隣接する室、さらに前記室に隣接する室とは隔壁で仕切られ、かつ各室はその下部にて相互に連通しているもので、順次隣の室に移動する。この移動の過程で、前記厨房排水の流速が遅くなり、かつ自然冷却と比重差による油水分離により油脂分が槽内上側に分離され、槽内の下側には、固形物が槽底に沈殿汚泥として分離され、中間の上澄み液が処理水として槽外へ排出される。この際、前記廃水に対し、好気性微生物が添加されているので、この微生物が廃水中の溶解性微生物(BOD成分)を吸着し、溶存酸素を消費しながら前記廃水中の油脂分及び沈殿汚泥となりうる浮遊固形物が酸化分解されて、最終的に炭酸ガスと水になるので、前記油脂分と汚泥の生成量は従来のグリーストラップ槽の場合に比べ、格段に少なくすることができる。

【0015】また、これらの油脂分及び沈殿汚泥は油脂返送手段、汚泥返送手段とによって残滓回収袋内に強制

5

的に戻され、残滓回収袋による濾過、槽内での比重差による分離、及び前記好気性微生物による酸化分解がエンドレスに繰り返される。このことにより、前記油脂分及び汚泥分は実質的にほとんど無視できる程度にまで少なくなり、排水管内に流れ込むことがないので、排水管の詰まりを発生させることなく、浄化された処理水のみが槽外へ排出される。しかも、この処理水中のBOD、SS及びノルマルヘキサン抽出物質の量もきわめて少なく、水質基準を十分に満たすものであるから周辺環境への悪影響もない。

【0016】さらに、これまでのグリーストラップ槽の場合のように、槽内に溜まった油脂分や汚泥分のバキュームによる吸引作業が一切不要となり、処理コストの大幅削減が可能となる。

【0017】また、本発明の好ましい実施形態にかかる廃水処理装置は、前記残滓回収袋を取付支持する支持具が前記槽本体に対して着脱自在に係止されている。

【0018】この廃水処理装置によれば、前記残滓回収袋は取替交換できる使い捨てタイプとすることができ、毎日あるいは隔日に新しいものと交換することにより、廃水処理装置本来の機能を低下させることなく、効率的な廃水処理を行うことができる。また、取替交換した残滓回収袋はそのまま生ゴミとして廃棄することができる。

【0019】さらに、本発明の好ましい実施形態にかかる廃水処理装置は、前記残滓回収袋が前記支持具の取付部位に対して着脱自在に設定されている。

【0020】この廃水処理装置によれば、前記残滓回収袋の取替交換がカートリッジ式に簡単かつ迅速に行える。したがって、有機残滓が溜まり、汚物処理として敬遠されがちな残滓回収袋の取替交換作業が誰にでも容易に行うことができ、毎日の取替交換を行うことにより、有機残滓の腐敗を防ぎ、かつ害虫やネズミの温床となることや雑菌の繁殖を防止できて、衛生的な廃水処理環境を実現できる。

【0021】

【発明の実施の形態】以下、本発明の第1実施形態にかかる廃水処理装置について図1および図2を参照しながら説明する。図1において、廃水処理装置1の直方体形の槽本体2は、隔壁3、3で槽内を複数、この例では3つの室4a、4b、4cに仕切り、かつ隣接する前記各室4a～4cをその下部にて相互連通するように構成されている。なお、4つ又は5つの室に仕切っても差し支えなく、厨房設備の規模や処理する廃水量との関係を考えて決定する。

【0022】また、前記槽本体2は、外部の排水導入管31からの廃水Dを導入する廃水導入口5と、前記廃水処理後の処理水Wを槽本体2外部に導出する処理水導出口6とを備え、前記廃水導入口5の所定部位には支持具7が着脱自在に係止され、この支持具7に対してネット

6

状の残滓回収袋8が支持されて取り付けられている。ここで、前記廃水処理装置1の形成材料としては、耐腐食性及び耐久性のある材料（例えばステンレス鋼）を用い、ネット状残滓回収袋8の形成素材としては、例えばストッキング等に用いられる目の細かい化学繊維素材からなるものが望ましく、使用後に生ゴミとして廃棄することを考慮し、ゴミ焼却場での焼却時に塩素ガスを発生しない素材がより望ましい。

【0023】また、前記槽本体2には、槽本体2内に導入された廃水Dに対して好気性微生物を添加する微生物注入手段9が付加され、かつ槽本体2内に前記好気性微生物の働きを活性化させるため、廃水D中に空気を送り込む空気供給手段10が設けられている。ここで、前記微生物注入手段9は、槽本体2の近くに付設した微生物収容タンク9aと、このタンク9aから室4aに設けた残滓回収袋8内及び室4b内に定量の微生物を添加できるようにした注入パイプ9bとから構成されている。また、空気供給手段10は、圧縮空気発生源10aと、この圧縮空気発生源10aからの空気を配管10bを介して室4a及び4b内の廃水D中に供給する気泡発生器10cとから構成されている。

【0024】なお、前記微生物注入手段9からの微生物の添加は、通常、例えばファミリーレストランや飲食店等では営業閉店時に行うものとし、添加する前記好気性微生物としては、例えば、Aeromonas属KHU株（エアロモナス属KHU株）を用いるが、他の好気性微生物であってもよい。また、前記空気供給手段10からの空気の供給は、廃水処理装置1の稼動中を通して継続されるが、空気の供給量は槽内の廃水量や微生物の添加量等との関係を考慮して適宜選択できるものとする。

【0025】また、前記槽本体2内には、その上側に浮遊して油脂層として溜まった油脂分を前記残滓回収袋8内に戻す油脂分返送手段11と、前記槽底に堆積した沈殿汚泥を前記残滓回収袋8内に戻す汚泥分返送手段12とが配装されている。

【0026】前記した油脂分返送手段11は、具体的には図2に示すように、一端開口11bが油脂層G内に位置し、他端開口11cが残滓回収袋8内に位置し、中間部が槽内の下方に位置するように構成された概略コの字状となったパイプ11aと、このパイプ11aの前記他端開口11c付近からパイプ11a内を下方に延びるように挿入された空気チューブからなるポンプ11dとを備えている。このポンプ11dは、いわゆるエアリフトポンプであり、空気チューブの下部周壁に多数の小孔を設け、空気チューブ11dに上方から導入された圧縮空気A1を小孔から噴出させて、その気泡によるエアリフトポンプ作用によって前記油脂分をパイプ11a内で上昇させて残滓回収袋8側へ強制的に戻す。なお、前記パイプ11aの断面形状は矩形でも丸形でもよく、その他の形状であってもよい。

【0027】同じく、及び汚泥分返送手段12も、一端開口12bが汚泥層S内に位置し、他端開口12cが残滓回収袋8内に位置するように構成された概略L字状となったパイプ12aと、このパイプ12aの前記他端開口12c付近からパイプ12a内を下方に延びるように挿入された空気チューブからなるエアリフト式のポンプ12dとを備え、エアリフトポンプ作用によって前記汚泥分Sを残滓回収袋8側へ強制的に戻すようになっている。なお、前記パイプ12aの断面形状は油脂分返送手段11の場合と同様、矩形でも丸形でもその形状を問わない。

【0028】前記した実施形態例1にかかる廃水処理装置では、残滓回収袋8により廃水D中に含まれる有機残滓等を濾過し（物理的处理）、かつ有機残滓が取り除かれた廃水Dを好気性微生物によって酸化分解させて、炭酸ガスと水とに分解することができる（生物处理）。これにより、油脂分や汚泥分を従来のグリーストラップ槽のように生物処理しない場合に比べ、格段に少なくすることができる。しかも槽内上側に溜まる油脂分（油脂層G）及び槽底側に溜まる汚泥分（沈殿汚泥S）は、いずれも常時、残滓回収袋8側へ強制的に戻されて、再度、残滓回収袋8での濾過および槽内での比重差による分離がなされるので、前記油脂分や汚泥分が微生物により酸化分解される滞留時間を長くとることができ、効果的な生物処理が行える。その結果、槽内上側に浮遊して溜まる油脂分及び槽底側に堆積する沈殿汚泥が存在しない状態、あるいはほとんど無視できる程度にまで激減させることができる。したがって、前記油脂分や沈殿汚泥のパキュムによる定期的な汲み取り作業が一切不要となり、前記油脂分や沈殿汚泥が槽内から取り除かれない場合の悪影響をなくすることができる。

【0029】次に、本発明の第2および第3実施形態にかかる廃水処理装置について図3及び図4を参照しながら説明する。図3及び図4は、いずれも残滓回収袋8の取付支持手段について示しており、例えば第3実施形態を示す図3のように、残滓回収袋8の上端開口部分8aを一定幅だけ支持具13の取付フレーム13aの全周にわたって折り曲げて支持させた後、前記取付フレーム13aに対して固定用フレーム13bを取り付け、これらのフレーム13a、13bの間を係止錠13cで固定する。このように、前記残滓回収袋8を前記フレーム13a、13bの間から容易に離脱しないように強固な状態に取り付ける。そして、この支持具13の固定フレーム13bから上方に延びる係止片13dの先端フック部13eを槽本体2の側壁上縁に係止する。このように構成することで、残滓回収袋8は必要に応じて取替交換可能な使い捨てタイプとすることができる。

【0030】また、図4に示す第3実施形態のように、前記残滓回収袋8に代え、先端81aが開放されたネット状筒体81を図3と同様の方法で取り付け、かつこの

ネット状筒体81の中間部81bを折り返して、前記先端81aを前記固定フレーム13bの引掛け部13fに引っ掛け、前記ネット状筒体81の一部を残滓回収袋として用いることもできる。この場合には、残滓回収袋として使用した部分を除く、折り返し部81bよりも先端81a寄りの部分を切断して、次の使用に供することも可能となる。

【0031】さらに、本発明の第4実施形態にかかる廃水処理装置について図5を参照しながら説明する。この実施形態例3では、特に、残滓回収袋82を支持具14に対して着脱自在に設定している。すなわち、同図に示すように、例えば支持具14の取付フレーム14aを平面視コの字形に形成し、この取付フレーム14aに平行なガイド溝14b、14bを形成し、槽本体2の側壁に係止させるための係止片14cを設け、かつこの係止片14cに先端フック部14dを設ける。一方、残滓回収袋82の上端開口部には、前記ガイド溝14b、14bに嵌り込む嵌込用フレーム82aを設けた構成とする。そして、前記取付フレーム14のガイド溝14a、14aに対して前記残滓回収袋82が取り付けられた嵌込用フレーム82aを水平状態にして矢印B方向に嵌め込むことで、前記残滓回収袋82を支持具14に対して支持する。このような構成とすることで、前記残滓回収袋82は、カートリッジ式になって、その取替交換作業を迅速かつ簡単に行うことができる。

【0032】本発明の第5実施形態にかかる廃水処理装置について図6を参照しながら説明する。この実施形態例は、前記第1実施形態における油脂分返送手段11及び汚泥分返送手段12をよりコンパクトにしたものである。すなわち、図6に示すように、油脂分返送手段15は、一本のパイプを折り返して、往路側パイプ15aの上端開口を第3室4cの油脂層G内に位置させるとともに、復路側パイプ15b内に空気チューブからなるエアリフト式のポンプ15cが挿入される構成とする。一方、汚泥分返送手段16は前記パイプ15bに接合されるパイプ16aを有し、このパイプ16aの下端開口を沈殿汚泥層S内に位置させ、かつこのパイプ16a内に空気チューブからなるエアリフト式のポンプ16bが挿入される構成とする。そして、前記パイプ15b及びパイプ16aの上端側開口と、残滓回収袋8との間にわたって架け渡される返送用樋17、18を、前記残滓回収袋8側に向かって下り勾配となるように配置している。

【0033】このような構成としたことで、図1の第1実施形態例1における油脂分返送手段11及び汚泥分返送手段12と同様の機能を発揮させることができるほか、図6の油脂分返送手段15及び汚泥分返送手段16自体がコンパクトとなるので、槽内への配置が容易かつ迅速に行える。特に、この第5実施形態にかかる油脂分返送手段15及び汚泥分返送手段16の場合、槽内の複数の室のうち、最終室4cに前記油脂分返送手段及15

び汚泥分返送手段16の要部を配置しさえすればよく、これらの手段15、16と残滓回収袋8との間を連絡する返送用樋17、18を槽内の廃水Dの液面よりも上方に配置するだけでよいから、既存のグリーストラップ槽に対しても簡単に適用でき、施工性・取付性に優れる。

#### 【0034】

【発明の効果】以上のように、本発明にかかる廃水処理装置によれば、物理的処理としての油水分離機能に加え、生物的处理として好気性微生物による酸化作用によって槽内上側に浮遊する油脂分や槽底側に堆積する沈殿汚泥の量を少なくすることができる。

【0035】しかも、前記油脂分や沈殿汚泥についても残滓回収袋側へ常時返送されて、濾過および比重差による分離が繰り返されるので、油脂分や汚泥分が好気性微生物によって酸化分解を受ける滞留時間が長くなって、前記油脂分や汚泥分のほぼすべてが炭酸ガスと水とに分解される。したがって、槽外へ排出される処理水は、油脂分や汚泥分の混じり込みのない浄化水として排出され、環境保全上、きわめて好ましい。また、槽内には、実質的に油脂分や汚泥分が存在しないので、バキュームによる汲み上げ作業が一切不要となり、廃水処理装置の維持管理コストを大幅に低減できる。

#### 【図面の簡単な説明】

【図1】本発明の第1実施形態にかかる廃水処理装置の概略構成を示す縦断面図である。

【図2】油脂分返送手段及び汚泥分返送手段を示す要部の縦断面図である。

【図3】第2実施形態にかかる残滓回収袋の取付支持構造（使い捨て袋タイプ）を示す要部拡大斜視図である。

【図4】第3実施形態にかかる残滓回収袋の取付支持構造（折り返しタイプ）を示す要部拡大斜視図である。

【図5】第4実施形態にかかる残滓回収袋の取付支持構造（カートリッジタイプ）を示す要部拡大斜視図である。

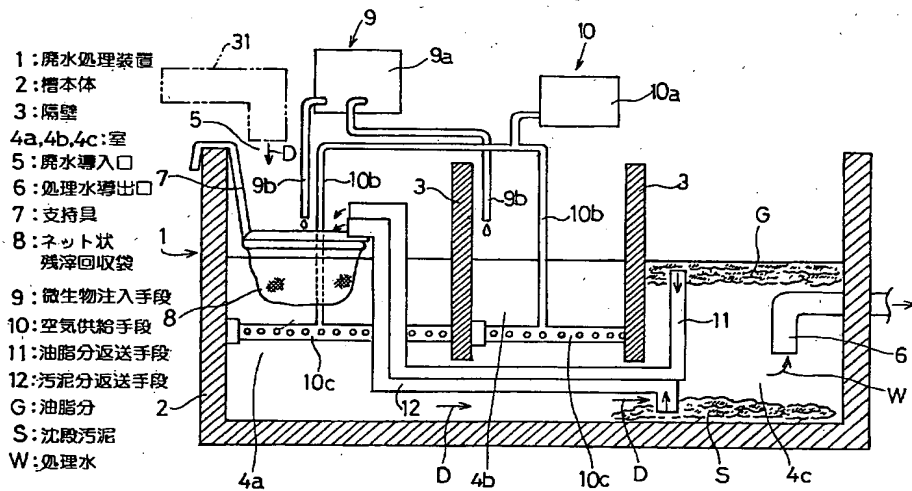
【図6】第5実施形態にかかる油脂返送手段及び汚泥返送手段の変形例を示す縦断面図である。

【図7】従来のグリーストラップ槽の構造を示す一部欠けた斜視図である。

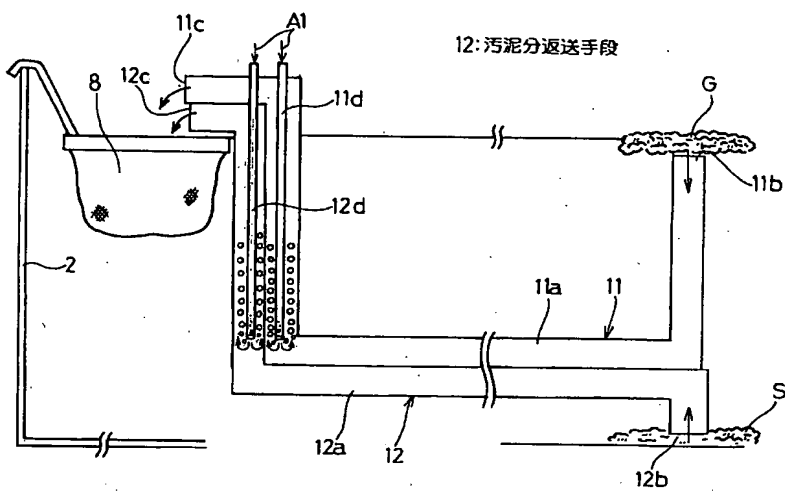
#### 【符号の説明】

1…廃水処理装置、2…槽本体、3…隔壁、4a、4b、4c…室、5…廃水導入口、6…処理水導出口、7…支持具、8…残滓回収袋、9…微生物注入手段、10…空気供給手段、11、15…油脂分返送手段、12、16…汚泥分返送手段、13、14…支持具、D…廃水、G…油脂分、S…沈殿汚泥層、W…処理水。

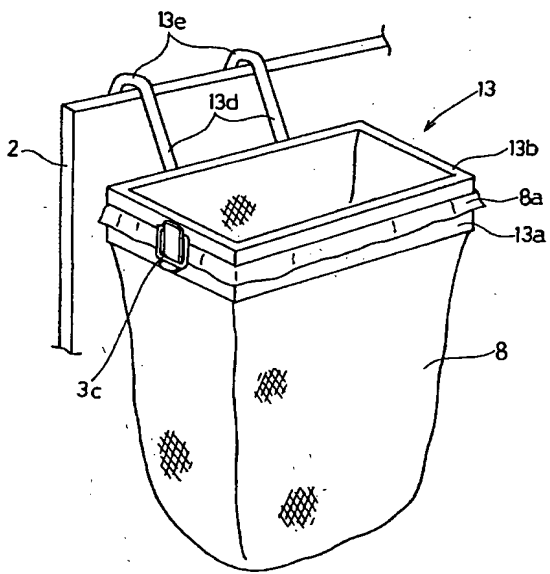
【図1】



【图2】

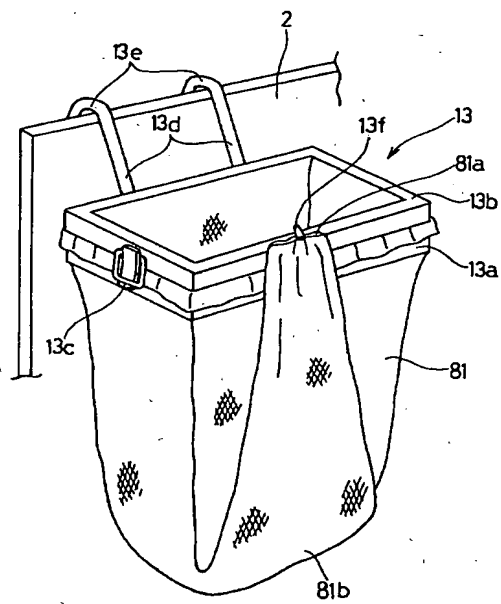


【図 3】



8:ネット状残滓回収袋 13:支持具

【図4】



13: 支持具      81: ネット状筒体

14: 支持具  
82: ネット状残液回収袋

15: 油脂分返送手段    16: 污泥分返送手段



Fターム(参考) 2D063 DB02 DB08  
4D003 AB02 BA02 CA03 DA09 DA19  
FA07  
4D027 BA06  
4D041 AA01 AB03 AB13 AB21 AD09  
AD16  
4D051 AA01 AB02 BA02 BA09

## PATENT ABSTRACTS OF JAPAN

No.2003-001282A

(11)Publication number : 2003-001282

(43)Date of publication of application : 07.01.2003

(51)Int.Cl.

C02F 3/02

B01D 29/27

C02F 1/40

C02F 3/00

E03F 5/16

(21)Application number : 2001-189874

(71)Applicant : KITAYAMA HARUICHI

(22)Date of filing : 22.06.2001

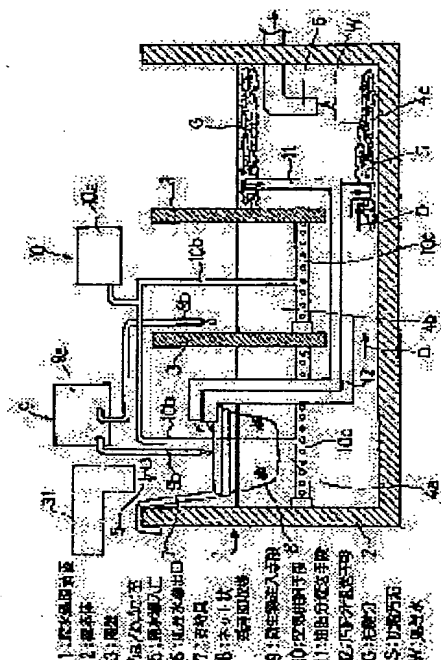
(72)Inventor : KINOSHITA KOJI

## (54) WASTE WATER TREATING DEVICE

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a waste water treating device which saves on work for removing oils, fats and sludge and can practice cleaning treatment of kitchen waste water.

**SOLUTION:** The waste water treating device is provided with a residuum recovering bag 8 which receives the kitchen waste water introduced from a waste water introducing port 5 and filters organic residuum, a microorganism injecting means 9 for adding aerobic microorganisms to the waste water introduced in a tank, an air supplying means 10 for sending air in the waste water in order to activate working of the aerobic microorganism, a fats and oils returning means 11 for returning oils and fats gathered at an upper side in the tank into the residuum recovering bag 8 and a sludge returning means 12 for returning sludge accumulated at a bottom side in the tank into the residuum recovering bag 8. Thereby microorganism treatment can be endlessly practiced by forcing the oils, fats and sludge to be returned into the residuum recovering bag 8.



## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

**【Claim(s)】**

**【Claim 1】** The tub body constituted so that the mutual free passage of each \*\* which divides the inside of a tub into two or more \*\*, and adjoins by the septum might be carried out in the lower part, It has the waste water inlet which introduces the waste water from the outside in said tub body, and treated water derivation opening which derives the treated water after said waste water treatment to the exterior of a tub body. Carry out oily water separation of the waste water introduced in the tub, and the amount of fats and oils are made to float as a fats-and-oils layer to the inside up side of a tub. The remnants recovery bag which is waste water treatment equipment discharged out of a tub by using as treated water the supernatant which a part for said fats and oils is removed [ supernatant ], and made the solid divide into the bottom of the tank as a precipitate sludge layer, and is filtered in response to the waste water introduced in a tub from said waste water inlet, A microorganism impregnation means to add aerobic bacteria to the waste water introduced in the tub, An air supply means to send in air into waste water and to activate work of said aerobic bacteria, Waste water treatment equipment equipped with a fats-and-oils part return means to return a part for the fats and oils which floats and collects on the inside bottom of a tub in said remnants recovery bag by the pump action, and a sludge part return means to return a part for the sludge which precipitates to a \*\*\*\*\* side in said remnants recovery bag by the pump action.

**【Claim 2】** Waste water treatment equipment by which the support which carries out attachment support of said remnants recovery bag is stopped free [ attachment and detachment ] to said tub body in claim 1.

**【Claim 3】** Waste water treatment equipment with which said remnants recovery bag is set up free [ attachment and detachment ] to the attachment part of said support in claim 2.

**【Detailed Description of the Invention】****【0001】**

**【Field of the Invention】** This invention relates to the waste water treatment equipment used for processing of the kitchen wastewater containing a part for the fats and oils especially discharged from the inside of kitchens, such as a family restaurant and a restaurant, etc. about the waste water treatment equipment which purifies waste water.

**【0002】**

**【Description of the Prior Art】** Although many animal and vegetable oils used for cooking are contained in the kitchen wastewater (waste water) from a restaurant, a family restaurant, etc., if it passes, without processing a part for these fats and oils in any way, as it is, while flowing the drain pipe, it cools and solidifies, it adheres to a drain pipe wall, and work of a septic tank will be worsened and it will become the cause which pollutes a river etc. Therefore, a duty of installation of a grease-trap tub (grease grease trap) is imposed upon the location equipped with cooking equipment, such as a restaurant or not only a family restaurant but for example, a hotel and a hotel, a hospital and a school facility, a daily dish store, a supermarket, a food-processing factory, a personnel dining-room, a dormitory, etc., by the Ministry of Construction notification No. 1597 and No. 1674 as waste water treatment equipment in 1976.

**【0003】** This grease-trap tub is what carries out oily water separation of the waste water, such as kitchen wastewater, and removes a part for fats and oils. You make late the rate of flow of the waste water which flowed from the sink, and said waste water makes it cool naturally further in the process which flows and moves in the inside of a tub. And it discharges outside by using as treated water the supernatant into which make the inside bottom of a tub float as a fats-and-oils layer, collect parts for said fats and oils using the specific gravity difference of the part for fats and oils and the moisture which are contained in waste water, and separate into said fats-and-oils layer bottom on the other hand, and the solid was made to divide as a precipitate sludge layer.

**【0004】** Here, drawing 7 explains the fundamental example of a configuration of said grease-trap tub. Namely, the grease-trap tub 20 shown in drawing 7 with the tub body 21 and the septa 22 and 22 with which the inside of this tub body 21 is divided into two or more \*\* (the case of the example of drawing -- three \*\* of 1st, 2nd, and 3rd \*\* 23a, 23b, and 23c) The remnants cage 24 which was made to estrange from the bottom of the tank, and was installed in 1st \*\* 23a divided by these septa 22 and 22, It consists of discharge drains 26 which connect the waste water installation tubing 25 which introduces kitchen wastewater in this remnants cage 24, and the drain pipe 27 connected to external sewerage tubing in 3rd

\*\* 23c. Moreover, the free passage openings 28a and 28b are formed between the partes basilaris ossis occipitalis of the tub body 21, it makes and said septa 22 and 22 are attached so that the mutual free passage of the lower part of said 1st, 2nd, and 3rd \*\* 23a, 23b, and 23c may be attained. Furthermore, by forming many holes of a predetermined dimension all over that perimeter, said remnants cage 24 makes a ridge function hold, and the organic remnants in the waste water D introduced into this have structure so that may be filtered inside.

【0005】 According to the grease-trap tub 20 constituted as mentioned above, the kitchen wastewater from a sink etc. is first introduced in the remnants cage 24 of said 1st \*\* 23a through the waste water installation guide 25. After organic remnants, such as leftover food contained in it, are removed by that interior and organic remnants are removed, the kitchen wastewater introduced in this remnants cage 24 enters into the 2nd next \*\* 23b through lower free passage opening 28a, as an arrow head A shows. And after entering into 2nd \*\* 23b, it enters into 3rd \*\* 23c which is the last room through lower free passage opening 28b further.

【0006】 Thus, the waste water D with which organic remnants were removed within the remnants cage 24 enters into 2nd \*\*23b and 3rd \*\* 23c from 1st \*\*23a, and in the process which carries out sequential migration, the rate of flow of said waste water D becomes slow, and it is cooled naturally. And according to the specific gravity difference, the amount of fats and oils float to the inside up side of a tub, and a part for fats and oils and the moisture which are contained in said waste water collect as a fats-and-oils layer G. Supernatant W which it separates [ W ] into the bottom for fats and oils, and made the solid divide into the bottom of the tank as a precipitate sludge (sludge) layer S on the other hand flows in in a drain pipe 28 through the discharge drain 26 as treated water, and, finally is discharged by external sewerage tubing. In addition, he pulls up the remnants cage 24 periodically, and is trying to remove it out of a tub about the organic remnants which are filtered and taken and collect in said remnants cage 24.

【0007】

【Problem(s) to be Solved by the Invention】 However, it separated into the bottom in said tub, and was hard to deal with it to the amateur about the precipitate sludge layer S which it floats and is deposited on a fats-and-oils part [ collecting ] G and \*\*\*\*\* side, and since it was the activity which tends to be disliked, the actual condition was that removal of a part for said fats and oils or the precipitate sludge layer S becomes tends to become deferment. Thus, unless removal of the fats-and-oils part (fats-and-oils layer) G has \*\*\*\*\* appropriately, in especially the facility that it is easy to decompose said fats-and-oils part G within a tub at the time of elevated temperatures, such as a summer, causes [ of an offensive odor and a nasty smell ] generating, and is equipped with cooking equipment etc., it is not desirable. Moreover, although the part will enter into the discharge drain 26 and will be discharged from an exhaust pipe 27 if the fats-and-oils part G is not removed appropriately but collects as it is, with time, the amount of said fats and oils carry out adhesion deposition like a cholest roll at the wall of the discharge drain 26, and it causes plugging of a drain pipe 27.

【0008】 Moreover, if the precipitate sludge S deposited on a \*\*\*\*\* side is left long, like said fats-and-oils part G, the discharge drain 26 will be entered, and it will be discharged from an exhaust pipe 27, and will become the cause of plugging of a drain pipe 28. Furthermore, when such a fats-and-oils part G and precipitate sludge S are discharged from an exhaust pipe 27 with treated water W, the water quality of treated water W deteriorates to the degree of pole, and a possibility of stopping suiting Water Quality Standards also has it. Therefore, the present condition is carrying out suction removal under the vacuum periodically by the vacuum contractor chiefly about the precipitate sludge S deposited on a fats-and-oils part [ which floats and collects on the inside bottom of a tub ] G, and \*\*\*\*\* side. Furthermore, if cleaning of said remnants cage 24 is not performed every day, either, there is also a possibility of the organic remnants which collected into it also serving as hotbeds, such as noxious insects, such as a cockroach, and a rat, and causing propagation of saprophytic bacteria, and it becomes the situation which is not very desirable on a health environment.

【0009】 Moreover, when said vacuum activity also has cooking equipment in the 1-second floor and it is in an upper-layers story at any rate, a problem is to carry in a vacuum machine to a grease-trap tub, it becomes the activity of going repeatedly, and effectiveness is very bad.

【0010】 Moreover, it cannot respond to plugging of a drain pipe only by doing the sucking activity of a part

for the fats and oils in a grease-trap tub, or sludge. for this reason, a year -- about at least 1 - 2 times -- high-pressure washing of a drain pipe -- it must carry out -- cost -- it is forced a quantity activity. moreover -- if plugging occurs in a drain pipe suddenly -- business -- not being closed -- it did not obtain but there was also a possibility of suffering serious damage.

【0011】 Furthermore, since it is the physical processing which paid its attention to oily water separation of waste water chiefly, said grease-trap tub is not taken into consideration even about reduction of the amount of BOD in the treated water discharged after processing (living thing-chemical oxygen demand), SS (solid), and normal-hexane extracts. Therefore, when a part for said fats and oils and precipitate sludge are mixed with said treated water and discharged although the present environmental standards are met unless a part for said fats and oils and precipitate sludge are mixed with treated water and discharged, there is a possibility that said environmental standards may not be met and there is also a possibility of receiving instruction from the supervisor agency in this case. In addition, when taking into consideration the near water pollution criteria assumed to become severer future still, to improve the structure of a grease-trap tub so that it may also have the biochemical-process (microorganism treatment) function to decrease the amount of said BOD, SS, and normal-hexane extracts was desired.

【0012】 This invention was made paying attention to the above mentioned technical problem, and mainly maintains the function of grease-trap tub original over a long period of time. In addition, it aims at offering the waste water treatment equipment which can discharge the treated water which these are made to disappear or decrease sharply by carrying out oxidative degradation of a part for fats and oils and precipitate sludge which were separated in the tub, and makes unnecessary removal of a part for said fats and oils and precipitate sludge by this, and meets environmental standards.

【0013】

【Means for Solving the Problem】 In order to attain the above mentioned purpose, the waste water treatment equipment concerning this invention The tub body constituted so that the mutual free passage of each \*\* which divides the inside of a tub into two or more \*\*, and adjoins by the septum might be carried out in the lower part, It has the waste water inlet which introduces the waste water from the outside in said tub body, and treated water derivation opening which derives the treated water after said waste water treatment to the exterior of a tub body. Carry out oily water separation of the waste water introduced in the tub, and the amount of fats and oils are made to float as a fats-and-oils layer to the inside up side of a tub. The remnants recovery bag which is waste water treatment equipment discharged out of a tub by using as treated water the supernatant which a part for said fats and oils is removed [ supernatant ], and made the solid divide into the bottom of the tank as a precipitate sludge layer, and is filtered in response to the waste water introduced in a tub from said waste water inlet, A microorganism impregnation means to add aerobic bacteria to the waste water introduced in a tub, An air supply means to send in air into waste water and to activate work of said aerobic bacteria, It has a fats-and-oils part return means to return a part for the fats and oils which floats and collects on the inside bottom of a tub in said remnants recovery bag by the pump action, and a sludge return means to return a part for the sludge which precipitates to a \*\*\*\*\* side in said remnants recovery bag by the pump action.

【0014】 If the waste water with which parts for many fats and oils, such as kitchen wastewater, are contained, for example is introduced in a remnants recovery bag from a waste water inlet according to this waste water treatment equipment, organic remnants, such as leftover food mixed into it, are filtered, and it is removed in said remnants recovery bag, and the waste water filtered by this will flow caudad, and will fall and collect. If this waste water reaches fixed water level, since \*\* in which the remnants recovery bag was prepared, and \*\* which adjoins this and \*\* which adjoins the aforementioned room further will be divided with a septum and each \*\* will be mutually open for free passage in that lower part, it moves to the next \*\* one by one. In process of this migration, the rate of flow of said kitchen wastewater becomes slow, and a part for fats and oils is separated into the inside bottom of a tub by the oily water separation by natural air cooling and the specific gravity difference, a solid is divided into the bottom in a tub as precipitate sludge in the bottom of the tank, and a middle supernatant is discharged out of a tub as treated water. under the present circumstances, since oxidative degradation of the suspension solid content which can serve as a part for fats and oils and precipitate sludge in said waste water while this microorganism adsorbs the soluble microorganism in waste water (BOD component) and dissolved oxygen is consumed since aerobic bacteria are added to said waste water is carried out and it finally

becomes carbon dioxide gas and water, compared with the case of the conventional grease-trap tub, the amount of generation of a part for said fats and oils and sludge can be boiled markedly, and can be lessened.

【0015】 Moreover, a part for these fats and oils and precipitate sludge are compulsorily returned in a remnants recovery bag by the fats-and-oils return means and the sludge return means, and filtration with a remnants recovery bag, the separation by the specific gravity difference within a tub, and the oxidative degradation by said aerobic bacteria are repeated by endless. Only the purified treated water is discharged out of a tub, without generating plugging of a drain pipe, since the amount of [ a part for said fats and oils and ] sludge decreases even in extent which can almost be disregarded substantially and it does not flow in in a drain pipe by this. And there are also very few amounts of BOD in this treated water, SS, and normal-hexane extracts, and since Water Quality Standards is fully met, there is also no bad influence to a circumference environment.

【0016】 Furthermore, like [ in the case of an old grease-trap tub ], the suction activity by the vacuum for a part for fats and oils or sludge which collected in the tub becomes entirely unnecessary, and the drastic reduction of processing cost of it is attained.

【0017】 Moreover, the support with which the waste water treatment equipment concerning the desirable operation gestalt of this invention carries out attachment support of said remnants recovery bag is stopped free [ attachment and detachment ] to said tub body.

【0018】 Efficient waste water treatment can be performed without reducing the function of waste-water-treatment-equipment original by exchanging for a new thing at every day or every other day, since said remnants recovery bag can be considered as the disposable type which can carry out replacement exchange according to this waste water treatment equipment. Moreover, the remnants recovery bag which carried out replacement exchange can be discarded as a kitchen garbage as it is.

【0019】 Furthermore, as for the waste water treatment equipment concerning the desirable operation gestalt of this invention, said remnants recovery bag is set up free [ attachment and detachment ] to the attachment part of said support.

【0020】 According to this waste water treatment equipment, it can carry out simply [ replacement exchange of said remnants recovery bag / a cartridge-type ] and quickly. Therefore, when organic remnants collect, and the replacement exchange activity of the remnants recovery bag which tends to be kept at arm's length as waste treatment can carry out to anyone easily and performs daily replacement exchange, propagation of preventing putrefaction of organic remnants and becoming the hotbed of a noxious insect or a rat or saprophytic bacteria can be prevented, and a sanitary waste-water-treatment environment can be realized.

【0021】

【Embodiment of the Invention】 It explains referring to drawing 1 and drawing 2 hereafter about the waste water treatment equipment concerning the 1st operation gestalt of this invention. In drawing 1, the tub body 2 of the rectangular parallelepiped form of waste water treatment equipment 1 is constituted so that the mutual free passage of said each \*\* 4a-4c which divide the inside of a tub with plurality and this example into three \*\* 4a, 4b, and 4c, and adjoin by septa 3 and 3 may be carried out in that lower part. In addition, it does not interfere with four or five \*\*, and it is decided at them in consideration of the scale of cooking equipment, or relation with the amount of waste water to process that it will be a batch.

【0022】 Moreover, it has the waste water inlet 5 which introduces the waste water D from the external wastewater installation tubing 31, and the treated water derivation opening 6 which derives the treated water W after said waste water treatment to the tub body 2 exterior, support 7 is stopped free [ attachment and detachment ] in the predetermined part of said waste water inlet 5, the network-like remnants recovery bag 8 is supported to this support 7, and said tub body 2 is attached. What consists of a chemical fiber material with a fine eye use for a stocking etc. as a formation material of the network-like remnants recovery bag 8 as a formation ingredient of said waste water treatment equipment 1 using an ingredient ( for example, stainless steel) with corrosion resistance and endurance, for example here is desirable, and the material which does not generate chlorine gas in consideration of discard as a kitchen garbage after use at the time of incineration at a garbage incineration plant is more desirable.

【0023】 Moreover, in order to add a microorganism impregnation means 9 to add aerobic bacteria to the

waste water D introduced in the tub body 2 to said tub body 2 and to activate work of said aerobic bacteria in the tub body 2, an air supply means 10 to send in air into waste water D is established. Here, said microorganism impregnation means 9 consists of feed pipe 9b which can add the microorganism of a quantum now in the remnants recovery bag 8 prepared in microorganism hold tank 9a attached near the tub body 2, and \*\* 4a from this tank 9a, and \*\* 4b. Moreover, the air supply means 10 consists of compressed-air generation source 10a and cellular generator 10c which supplies the air from this compressed-air generation source 10a into the waste water D in \*\*4a and 4b through piping 10b.

【0024】 In addition, as said aerobic bacteria which shall usually perform addition of the microorganism from said microorganism impregnation means 9 in a family restaurant or a restaurant at the time of operating closing, and are added, it is an Aeromonas group, for example. Although a KHU stock (Aeromonas group KHU stock) is used, you may be other aerobic bacteria. Moreover, although supply of the air from said air supply means 10 is continued [ be / it / under / waste water treatment equipment's 1 operation / letting it pass ], the amount of supply of air shall be suitably chosen in consideration of the relation between the amount of waste water in a tub, the addition of a microorganism, etc.

【0025】 Moreover, a fats-and-oils part return means 11 to return a part for the fats and oils which floated to the up side and collected as a fats-and-oils layer in said tub body 2 in said remnants recovery bag 8, and a sludge part return means 12 to return the precipitate sludge which accumulated on said bottom of the tank in said remnants recovery bag 8 are \*\*\*\*(ed).

【0026】 As the above mentioned fats-and-oils part return means 11 is specifically shown in drawing 2 , end opening 11b is located in the fats-and-oils layer G. Pipe 11a used as the outline horseshoe-shaped constituted so that other end opening 11c might be located in the remnants recovery bag 8 and pars intermedia might be located down [ in a tub ], It has pump 11d which consists of an air tube inserted so that the inside of pipe 11a might be caudad extended from near [ said ] other end opening 11c of this pipe 11a. It is the so-called air lift pump, this pump 11d prepares many stomata in the lower peripheral wall of an air tube, makes the compressed air A1 introduced into air tube 11d from the upper part blow off from a stoma, according to the air-lift-pump operation by those air bubbles, makes the amount of said fats and oils go up within pipe 11a, and is compulsorily returned to the remnants recovery bag 8 side. In addition, a rectangle or a round shape is sufficient as the cross-section configuration of said pipe 11a, and they may be other configurations.

【0027】 Pipe 12a used as the shape of an outline of L characters which the sludge part return means 12 also consisted of the same so that end opening 12b might be located in the sludge layer S and other end opening 12c might be located in the remnants recovery bag 8, It has pump 12d of an airlift type which consists of an air tube inserted so that the inside of pipe 12a might be caudad extended from near [ said ] other end opening 12c of this pipe 12a, and said sludge part S is compulsorily returned to the remnants recovery bag 8 side according to an air-lift-pump operation. In addition, the cross-section configuration of said pipe 12a does not ask the configuration by the rectangle or the round shape as well as the case of the fats-and-oils part return means 11.

【0028】 In the waste water treatment equipment concerning the above mentioned example 1 of an operation gestalt, oxidative degradation of the waste water D with which the organic remnants contained in waste water D with the remnants recovery bag 8 were filtered (physical processing), and organic remnants were removed can be carried out by aerobic bacteria, and it can decompose into carbon dioxide gas and water (biological treatment). thereby, compared with the case where biological treatment is not carried out like the conventional grease-trap tub, a part for a part for fats and oils or sludge can be boiled markedly, and can be lessened. And since it is compulsorily returned to the remnants recovery bag 8 side and separation by filtration with the remnants recovery bag 8 and the specific gravity difference within a tub is always made again, part for each sludge which collects on a part for fats and oils which collects on the inside bottom of tub (fats-and-oils layer G), and bottom of the tank side (precipitate sludge S) can take the long residence time to which oxidative degradation of the part for a part for said fats and oils or sludge is carried out by the microorganism, and can perform effective biological treatment. Consequently, even the condition that the precipitate sludge deposited on a part for fats and oils which floats and collects on the inside bottom of tub, and bottom of the tank side does not exist, or extent which can almost be disregarded can be made to decrease sharply. Therefore, the periodical dipping-up activity by the vacuum of a part for said fats and oils or precipitate sludge becomes entirely unnecessary, and a

bad influence in case neither a part for said fats and oils nor precipitate sludge is removed out of a tub can be lost.

【0029】 Next, it explains, referring to drawing 3 and drawing 4 about the waste water treatment equipment concerning the 2nd and 3rd operation gestalt of this invention. Each of drawing 3 and drawing 4 like drawing 3 which shows the attachment support means of the remnants recovery bag 8, for example, shows the 3rd operation gestalt After only constant width makes upper limit opening partial 8a of the remnants recovery bag 8 bend and support over the perimeter of attachment frame 13a of support 13, frame 13b for immobilization is attached to said attachment frame 13a, and between these frames 13a and 13b is fixed by stop lock 13c. Thus, it attaches in a firm condition so that it may not secede from said remnants recovery bag 8 easily from between said frames 13a and 13b. And tip hook section of 13d of stop pieces prolonged in the upper part from fixed frame 13b of this support 13 13e is stopped to the side-attachment-wall upper limb of the tub body 2. thus, the thing to constitute -- the remnants recovery bag 8 -- the need -- responding -- exchange -- it can consider as an exchangeable disposable type.

【0030】 Moreover, like the 3rd operation gestalt shown in drawing 4 , it replaces with said remnants recovery bag 8, and the network-like barrel 81 by which tip 81a was opened wide can be attached by the same approach as drawing 3 , pars intermedia 81b of the network-like barrel 81 of a parenthesis can be turned up, said tip 81a can be hooked on 13f of hook sections of said fixed frame 13b, and said a part of network-like barrel 81 can also be used as a remnants recovery bag. In this case, the part of tip 81a approach is cut from clinch section 81b except the part used as a remnants recovery bag, and it also becomes possible to present next use.

【0031】 Furthermore, it explains, referring to drawing 5 about the waste water treatment equipment concerning the 4th operation gestalt of this invention. Especially in this example 3 of an operation gestalt, the remnants recovery bag 82 is set up free [ attachment and detachment ] to support 14. That is, as shown in this drawing, attachment frame 14a of support 14 is formed in the shape of [ of plane view KO ] a typeface, the guide slots 14b and 14b parallel to this attachment frame 14a are formed, piece of stop 14c for stopping the side attachment wall of the tub body 2 is prepared, and 14d of tip hook sections is prepared in piece of stop 14c of a parenthesis. On the other hand, it considers as the configuration which prepared frame 82a for \*\*\*\* which gets into said guide slots 14b and 14b in upper limit opening of the remnants recovery bag 82. And said remnants recovery bag 82 is supported to support 14 by changing into a level condition frame 82a for \*\*\*\* in which said remnants recovery bag 82 was attached to the guide slots 14a and 14a of said attachment frame 14, and inserting in in the direction of arrow-head B. By considering as such a configuration, said remnants recovery bag 82 becomes a cartridge-type, and can do the replacement exchange activity quickly and easily.

【0032】 It explains referring to drawing 6 about the waste water treatment equipment concerning the 5th operation gestalt of this invention. This example of an operation gestalt uses more the fats-and-oils return means 11 and the sludge return means 12 in said 1st operation gestalt as a compact. That is, as shown in drawing 6 , the fats-and-oils return means 15 is considered as the configuration by which pump 15c of the airlift type which consists of an air tube is inserted into return trip side pipe 15b while it turns up one pipe and locates upper limit opening of outward trip side pipe 15a in the fats-and-oils layer G of 3rd room 4c. On the other hand, the sludge part return means 16 has pipe 16a joined to said pipe 15b, locates lower limit opening of this pipe 16a in the precipitate sludge layer S, and is considered as the configuration in which pump 16b of the airlift type which consists of an air tube in pipe 16a of a parenthesis is inserted. And \*\* 17 and 18 for return over which it is built over upper limit side opening of said pipe 15b and pipe 16a and the remnants recovery bag 8 is arranged so that it may become a downhill grade toward said remnants recovery bag 8 side.

【0033】 Since the same function as the fats-and-oils part return means 11 and the sludge part return means 12 in the example 1 of the 1st operation gestalt of drawing 1 can be demonstrated by having considered as such a configuration and also fats-and-oils part return means [ of drawing 6 ] 15 and sludge part return means 16 the very thing becomes compact, it can carry out easily [ arrangement into a tub ], and quickly. In the case of the fats-and-oils part return means 15 which starts this 5th operation gestalt especially, and the sludge part return means 16 That the important section of the return means 16 must be arranged by said fats-and-oils part return \*\*\*\*\* 15 \*\*\*\*\* to last room 4c among two or more \*\* in a tub Since what is necessary is just to arrange \*\* 17 and 18 for return which connects between these means



15 and 16 and the remnants recovery bags 8 more nearly up than the oil level of the waste water D in a tub, it can apply easily also to the existing grease-trap tub, and excels in workability and attachment nature.

**【0034】**

**【Effect of the Invention】** As mentioned above, according to the waste water treatment equipment concerning this invention, in addition to the oily water isolation as physical processing, the amount of the precipitate sludge deposited on a part for fats and oils which floats to inside up side of tub by oxidation by aerobic bacteria as living thing-processing, and bottom of the tank side can be lessened.

**【0035】** and the residence time from which the amount of [ a part for fats and oils or ] sludge receives oxidative degradation by aerobic bacteria since a remnants recovery bag side is always returned also about a part for said fats and oils, or precipitate sludge and filtration and separation by the specific gravity difference are repeated -- long -- becoming -- a part for a part for said fats and oils, or sludge -- all are mostly decomposed into carbon dioxide gas and water. Therefore, the treated water discharged out of a tub is discharged as purification water without the mix lump for sludge [ a part for fats and oils ], and is very desirable on environmental preservation. Moreover, since the amount of [ a part for fats and oils or ] sludge does not exist substantially in a tub, the pumping activity by the vacuum becomes entirely unnecessary, and the maintenance cost of waste water treatment equipment can be reduced sharply.

**【Brief Description of the Drawings】**

**【Drawing 1】** It is drawing of longitudinal section showing the outline configuration of the waste water treatment equipment concerning the 1st operation gestalt of this invention.

**【Drawing 2】** It is drawing of longitudinal section of an important section showing a fats-and-oils part return means and a sludge part return means.

**【Drawing 3】** It is the important section expansion perspective view showing the attachment supporting structure (disposable bag type) of the remnants recovery bag concerning the 2nd operation gestalt.

**【Drawing 4】** It is the important section expansion perspective view showing the attachment supporting structure (clinch type) of the remnants recovery bag concerning the 3rd operation gestalt.

**【Drawing 5】** It is the important section expansion perspective view showing the attachment supporting structure (cartridge type) of the remnants recovery bag concerning the 4th operation gestalt.

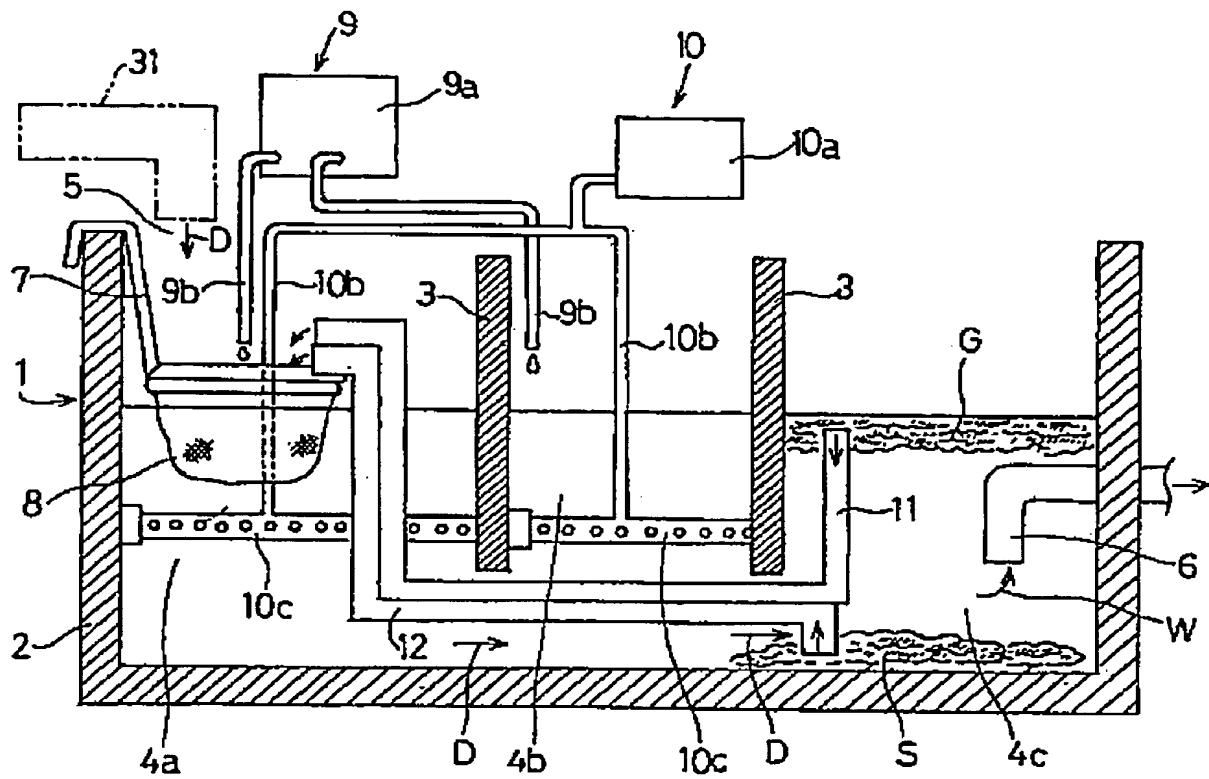
**【Drawing 6】** It is drawing of longitudinal section showing the modification of the fats-and-oils return means concerning the 5th operation gestalt, and a sludge return means.

**【Drawing 7】** It is the perspective view showing the structure of the conventional grease-trap tub cut in part.

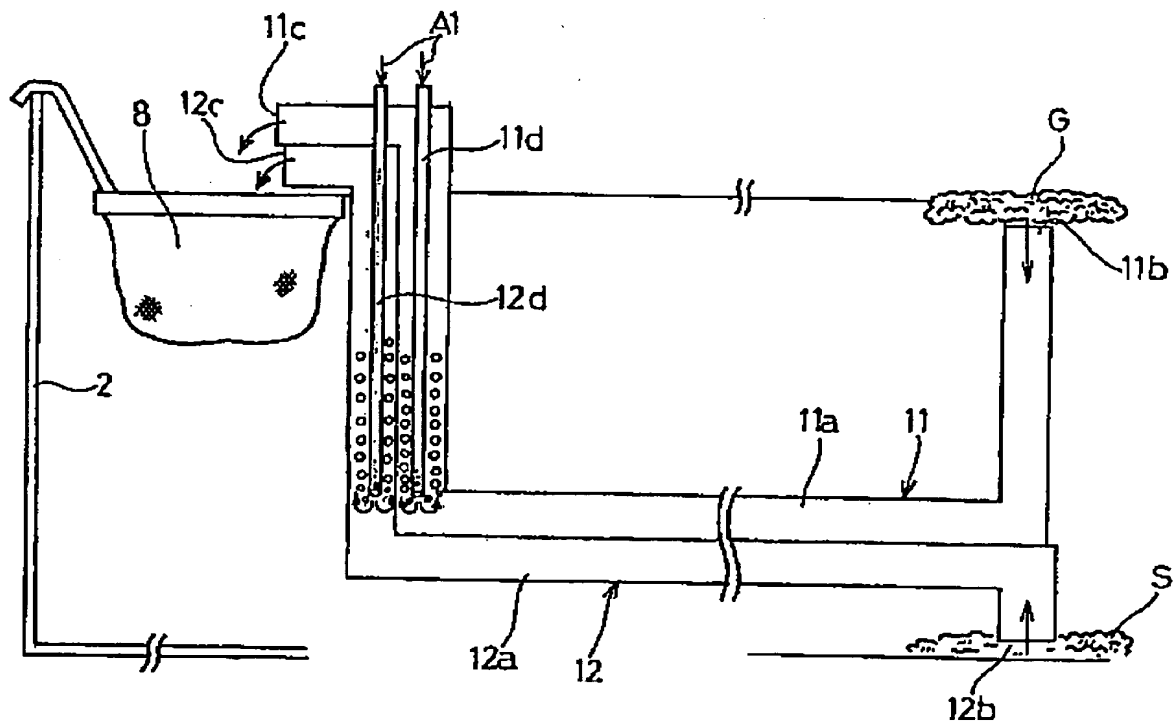
**【Description of Notations】**

1...Waste water treatment equipment, 2...A tub body, 3...A septum, 4a, 4b, 4c...Room, 5...Waste water inlets, 6...Treated water derivation opening, 7...Support, 8...A remnants recovery bag, 9...A microorganism impregnation means, 10...An air supply means, 11,15...A fats-and-oils part return means, 12,16...A sludge part return means, 13,14...Support, D...Waste water, G...A part for fats and oils, S...A precipitate sludge layer, W...Treated water.

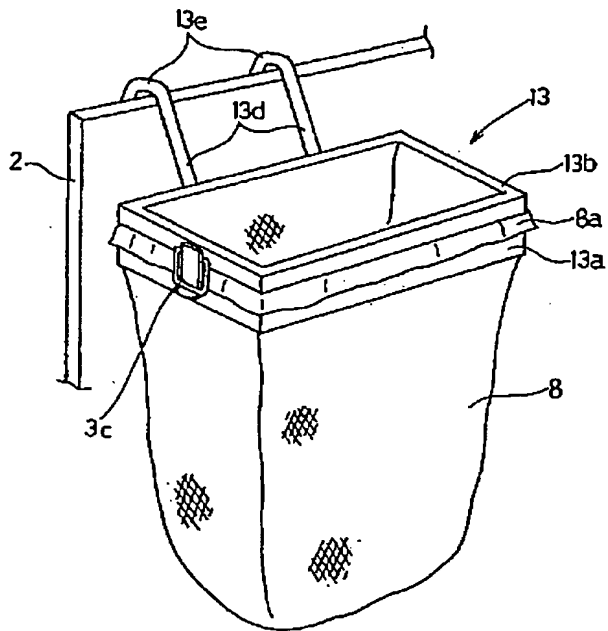
**【Drawing 1】**



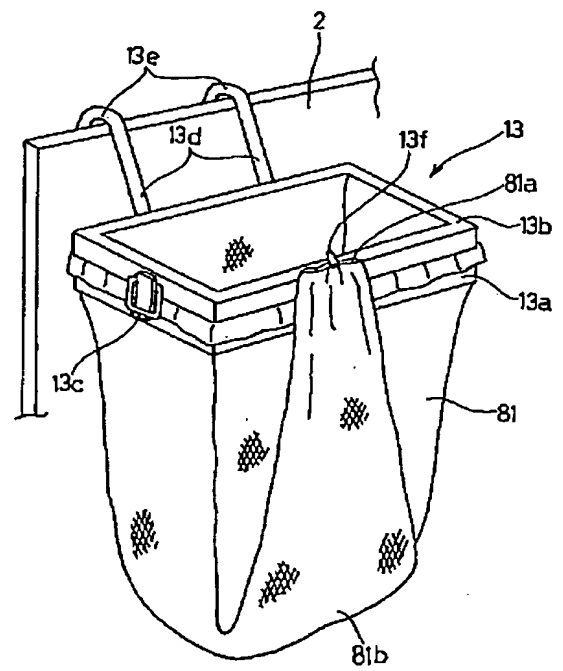
**【Drawing 2】**



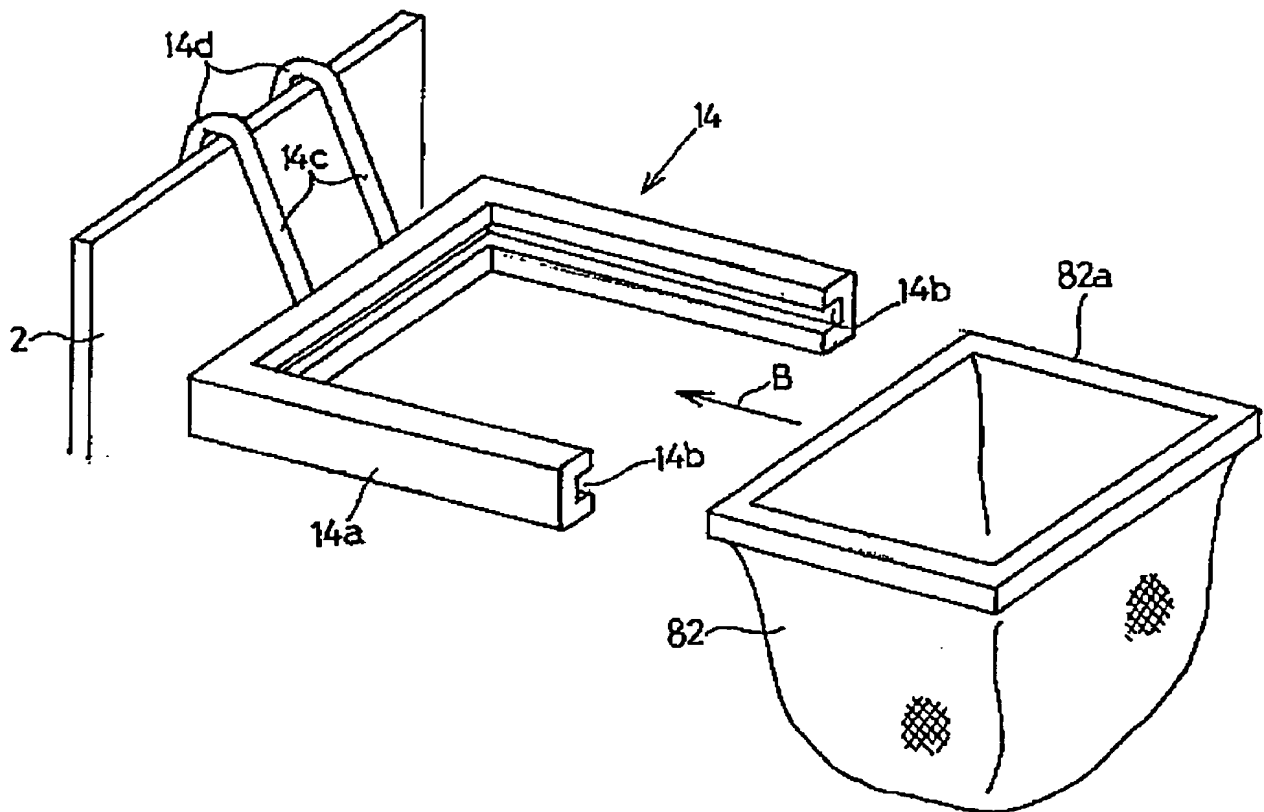
【Drawing 3】



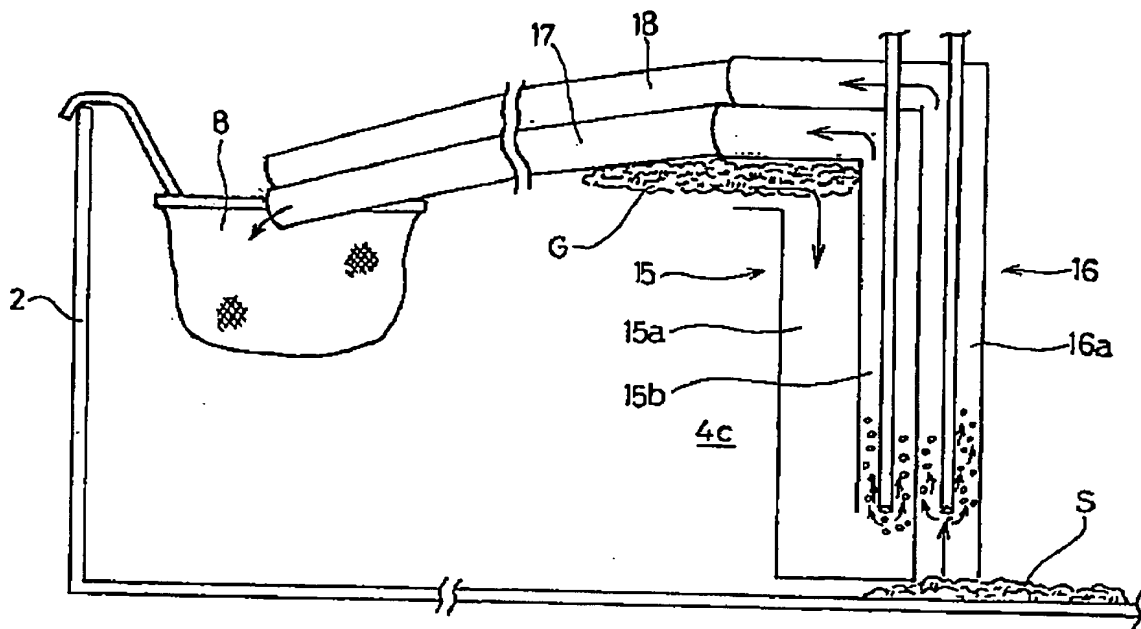
【Drawing 4】



【Drawing 5】



【Drawing 6】



【Drawing 7】

